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Declaration for the Record of Decision
Douglas Road Landfill
Landfill Cap Operable Unit

Site Name and Location

Douglas Road Landfill
Mishawaka, Indiana

Statement of Basis and Purpose

This decision document presents the selected remedial action for the landfill cap operable unit at the Douglas Road Landfill Site (the Site) in Mishawaka, Indiana. This remedial action was selected in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Contingency Plan. The selection of this remedy is based on the Administrative Record for the Site.

The State of Indiana concurs with the selected remedy.

Assessment of the Site

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to human health, welfare, or the environment.

Description of the Selected Remedy

This operable unit action is the first of two planned for this Site. It specifically outlines an action to address on-site soil and waste material contamination, which have been determined by the Remedial Investigation to pose unacceptable risks to human health and the environment.

The major components of the selected remedy include:

- Installation of a Composite Barrier Cap with a GCL Soil Barrier Layer, meeting the requirements of 329 IAC 2-14-19.
- Collection and disposal of landfill gas
- Perimeter ditches to collect surface water drainage
- Groundwater and source area monitoring to ensure that the goals of this action are met.

Declaration

The selected remedy is protective of human health and the environment, complies with Federal and State applicable or relevant and appropriate requirements for this operable unit action, is cost effective, and consistent with achieving a permanent remedy. This operable unit action utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site. However, because treatment of the principal threats of the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element. Subsequent actions at the site will address other threats posed by conditions at this site. Because this remedy will result in hazardous substances remaining on-site above health based levels, a review will be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment within five years after commencement of this remedial action. Because this is the first of two operable unit actions at the site, review of this site and of this remedy will be continuing as EPA continues to develop other remedial alternatives for this site.

7/13/95
Date

David A. Ullrich
for Valdas V. Adamkus
Regional Administrator

O: WMD
CC: RA/RF ~~LTR ONLY~~

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We make Indiana a cleaner, healthier place to live

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Mr. Valdas Adamkus
Regional Administrator
United States Environmental
Protection Agency
77 West Jackson Blvd
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Dear Mr. Adamkus:

Re: Record of Decision
Operable Unit Two of
Site Remedy
Douglas Road Landfill
Mishawaka, IN

The Indiana Department of Environmental Management has reviewed the U.S. Environmental Protection Agency's Record of Decision for the Douglas Road Landfill Superfund site. IDEM fully concurs with the major components of the selected remedy for Operable Unit Two of this site which include:

Placement of a composite barrier cap with a GCL soil barrier layer. The typical cross section for this composite barrier cap consists of (from top to bottom): a topsoil layer, a protective soil layer, an aggregate or sand drainage layer with a minimum permeability of $1 \times 10^{(-2)}$ cm/s, a flexible membrane liner, a GCL soil barrier layer having a maximum permeability of $1 \times 10^{(-8)}$ cm/s, and a bedding layer.

We also agree that this action attains Federal and State requirements that are applicable, or relevant and appropriate to this final site remedy. Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted within five years after commencement of the remedial action to ensure the remedy continues to provide adequate protection of human health and the environment.

IDEM staff have been working closely with Region V staff in the selection of an appropriate final remedy for the Douglas Road Landfill and are satisfied that the selected alternative for Operable Unit Two of this site adequately addresses the risks to human health and the environment posed by the soils.

Decision Summary
Douglas Road Landfill
Mishawaka, Indiana

Site Name, Location and Description

Douglas Road Landfill
Mishawaka, Indiana

The Douglas Road Landfill site (The Site) is located in St. Joseph County just north of Mishawaka, Indiana. The site is approximately 16 acres in size and is located near the northwest corner of Douglas and Grape Roads. The Site is bounded by the right-of-way for the Indiana State Toll Road to the north, a shopping center and an apartment complex to the east, residential properties and Douglas Road to the south, and agricultural land to the west (See Figure 1).

Site History and Enforcement Activities

In the early 1950s, the property was excavated and gravel onsite was used for the construction of the interstate. Uniroyal Plastics, Inc. (Uniroyal) leased the gravel pit and used it as a repository for plant wastes between 1954 and 1979. From 1954 to 1971, solvents, fly ash, paper, wood stock, rubber and plastic scrap were disposed of at the landfill. Only fly ash was disposed of from 1971 to 1979. In December 1979, the site was closed to avoid having to comply with impending RCRA regulations pertaining to the operation of a landfill.

According to the information provided by Uniroyal, about 302,400 gallons of RCRA hazardous waste were disposed of at the landfill. Liquid wastes included methyl ethyl ketone, acetone, tetrahydrofuran, toluene, hexane, and xylene. Historical aerial photographs of the landfill indicate several pits containing liquid that may have been used for disposal; the largest (and longest used) was in the central area of the landfill (See Figure 1).

The landfill was nominated for inclusion on the NPL on June 10, 1986, and placed on the NPL on March 31, 1989. In September, 1989, the State of Indiana and Uniroyal signed a consent decree, in which Uniroyal agreed to perform a RI/FS at the site. Before completion of this work, Uniroyal filed for bankruptcy and discontinued work at the site (November 1991).

Following the bankruptcy, it was determined that U.S. EPA should regain the site lead and the RI/FS was began in early 1994, using Superfund money. These investigations were completed in the fall of 1994.

Highlights of Community Participation

Public participation requirements under CERCLA Sections 113 (k)(2)(B) (i-v) and 117 were satisfied during the RI/FS process. U.S. EPA has been primarily responsible for conducting the community involvement program for this Site, with the assistance of the Indiana Department of Environmental Management (IDEM). The following public participation activities, to comply with CERCLA, were conducted during the RI/FS.

- A Community Involvement Plan was developed in 1994, to assess the community's informational needs related to the Douglas Road Landfill site and to outline community involvement activities to meet these needs. Residents and community officials were interviewed and their concerns were incorporated into this plan.

- A public information repository was established at the Mishawaka-Penn Public Library.

- A mailing list of interested citizens, organizations, news media, and elected officials in local, county, State and Federal government was developed. Fact sheets and other information regarding site activities were mailed periodically to all persons or entities on this mailing list. This mailing list has been updated on a continual basis as more individuals have become aware of the contaminated residential well problem.

- A Fact Sheet was mailed to the public in April 1994, that announced a public meeting to discuss the upcoming Remedial Investigation and answer site related questions from the public.

- A public meeting on April 20, 1994, at the Walt Disney School in Mishawaka announced the beginning of the Remedial Investigation and provided details about its conduct.

- A fact sheet was mailed to the public in September 1994, that announced an availability session on September 28, 1994, to discuss sampling results from the Remedial Investigation.

- An Availability Session was held on September 28, 1994 at the Walt Disney School to discuss RI progress and answer questions from the public regarding residential well contamination discovered during the RI.

Subsequent actions will be taken to provide a city water extension to residential properties affected by site contamination, and to address remediation of groundwater contaminated by the site. This operable unit will be designed to be consistent with any and all potential future cleanup actions at the site.

Site Characteristics

The RI/FS was conducted to identify the types, quantities and locations of contaminants at the site and to develop alternatives that best address these contamination problems. The nature and extent of actual or potential contamination related to the site was determined by a series of field investigations, including:

- development of detailed information regarding historical site operations
- on-site surface soil sampling
- performance of a geoprobe survey to aid in the optimal placement of groundwater monitoring wells
- installation and sampling of groundwater monitoring wells, both on-site and off-site
- identification and sampling of existing groundwater wells in the site vicinity
- preparation of a site-wide human health and ecological risk assessment
- contaminant fate and transport modeling and analysis

Site Geology:

The Douglas Road Landfill site is underlain by unconsolidated glacial deposits ranging from 30 to 200 feet thick. The glacial deposits consist of sand and gravel outwash, interbedded with clayey tills formed by the Saginaw Lobe of the Wisconsinan glacial event. In the site area, an intermediate deposit of clay till separates the sand and gravel outwash into upper and lower units. This clay unit has an irregularly sloping scoured surface, dipping northwest, with a bottom elevation ranging from 600 feet msl near the Michigan state line to 675 feet msl near Mishawaka.

A basal clay till unit is also observed throughout the area, directly overlying the bedrock. Soils on the landfill surface consist of a well-drained sandy loam material, intermixed with areas of gravel, fly ash, coal and sand.

Groundwater samples collected from residential wells were found to be contaminated with volatile organics up to levels of 100 ppb.

Summary of Site Risks

This Record of Decision is written for an operable unit action to address the contaminated soils and waste materials at the site. The RI report contains a Risk Assessment, prepared by CH2M Hill using the Risk Assessment Guidance for Superfund and approved by EPA as a portion of the RI report, that calculated the actual or potential risks to human health and the environment that may result from exposure to site contamination. Risks associated with exposure to contaminated groundwater will be summarized in a subsequent ROD to address contaminated groundwater.

The risk assessment determined that the majority of risks associated with exposure at the site were attributed to dioxin, PCBs, PAHs and bis (2-ethyl hexyl) phthalate.

Actual or threatened releases of hazardous substances from this site not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare or the environment.

Toxicity Assessment

Cancer potency factors (CPFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of (mg/kg-day)(-1) are multiplied by the estimated intake of a potential carcinogen,in mg/kg-day, to provide an upper bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Cancer potency factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal to human extrapolation and uncertainty factors have been applied (e.g. to account for the use of animal data to predict effects on humans).

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of chemicals from environmental media (e.g. the amount of a chemical ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty

vomiting, headaches, fatigue, muscular aches and joint pains, peripheral neuropathy, loss of libido, and irritation of eyes, respiratory tract and skin.

Bis (2-ethyl hexyl) phthalate Chronic exposure at relatively high concentrations have retarded growth and resulted in increased liver and kidney weight in experimental animals. Some evidence exists in animals of teratogenic and ferotoxic effects. Reproductive effects, decreased fertility and testicular damage have been noted in rodents. Phthalates are poorly absorbed through the skin and are rapidly metabolized.

Risk Assessment

Excess lifetime cancer risks are determined by multiplying the intake level with the cancer potency factor. These risks are probabilities that are generally expressed in scientific notation (e.g., 1 x 10(-6) or 1E-6). An excess lifetime cancer risk of 1 x 10(-6) indicates that, as a plausible upper bound, an individual has a one in one million chance of developing cancer as a result of site related exposure to a carcinogen over a 70 year lifetime under the specific exposure conditions at a site.

Potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as the hazard quotient (HQ)(or the ratio of the estimated intake derived from the contaminant concentration in a given medium to the contaminant's reference dose). By adding the HQs for all contaminants within a medium or across all media to which a given population may reasonably be exposed, the Hazard Index (HI) can be generated. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

Carcinogenic risks described in the risk assessment for exposure to contaminated surface soil at the site were computed for several potential exposure scenarios, including residential child, residential adult, teenage trespasser, and occupational adult exposures. The combined pathways carcinogenic risk for surface soil exposure at the site exceeds 1 x 10(-6) for all receptor groups, ranging from 2.4 x 10(-4) for adults engaged in occupational activities to 2 x 10(-6) for a teenage trespasser. The principal carcinogenic risk contributors are dioxin, PCBs, PAHs, and bis (2-ethyl hexyl) phthalate (See Table 1).

The non-carcinogenic risks associated with future exposure to contaminated surface soil at the site were computed for the same exposure scenarios as were used for the carcinogenic risks. Generally, total Hazard Indices (HI) are used to calculate non carcinogenic risks and must be below a value of 1.0; otherwise U.S. EPA policy requires remedial action. The assessment of future non-carcinogenic risks shows a combined ingestion, dermal,

and inhalation hazard index ranging from 0.009 for a teenage trespasser to 27.08 for adults in a residential setting (See Table 1).

An ecological risk assessment determined whether the contaminants present at the site and evaluated potential threats to ecological receptors in the absence of any remedial actions.

The results of this assessment, as summarized in the risk assessment portion of the RI, determined that due to exposure to site contaminants, ecological damage from surface soil contamination is likely in the absence of any remedial actions.

Description of Alternatives

A Focused Feasibility Study (FFS) was completed for this site using the presumptive remedy guidance, which calls for the analysis of a very limited number of cleanup options for the site remediation. During the FFS, a list of alternatives was developed that could be used to address the threats and/or potential threats identified for the soil at the site. The list of alternatives was screened based on criteria for effectiveness (i.e. protection of human health and the environment, reliability), implementability (i.e. technical feasibility, compliance with applicable Federal and State regulations) and relative costs (i.e. capital, operation and maintenance).

Following this initial screening, the list of alternatives was evaluated and only alternatives that met the nine criteria, listed below in the comparative analysis section, were submitted for detailed analysis. The Hydrologic Evaluation of Landfill Performance (HELP) model was used to evaluate the performance of each capping alternative for inhibiting infiltration of rainwater, which assisted with the comparison of each alternative to the no action alternative.

Alternative 1 No Action

Under this alternative, no remediation would occur and the site would remain in its present condition. This alternative will not reduce any potential public health or environmental risks currently associated with the site. This alternative will include access and deed restrictions limiting the future use of groundwater and surface water at the site and limiting future site development. The inclusion of the no action alternative is required by law to give U.S. EPA a basis for comparison.

Present Worth Cost:	$200,000
Time to Implement:	2-4 weeks

Alternative 4A Composite Barrier Cap with a Compacted Clay Soil Barrier Layer

This alternative consists of placement of a composite barrier cap with a compacted clay soil barrier. The typical cross section for a composite barrier cap consists of (from top to bottom): a topsoil layer, a protective soil layer, an aggregate or sand drainage layer with a minimum permeability of 1 x 10(-2) cm/s, a flexible membrane liner, a compacted clay soil barrier layer with a maximum permeability of 1 x 10(-7) cm/s, and a bedding layer. In addition to the cap, access restrictions will be implemented to restrict site use and access. These restrictions will include deed restrictions to control site development and groundwater use and fencing to inhibit unauthorized access to the landfill property.

Present Worth Cost:	$5,800,000
Time to Implement:	5 months

Alternative 4B Composite Barrier Cap with a GCL Soil Barrier Layer

This alternative consists of placement of a composite barrier cap with a GCL soil barrier layer. The typical cross section for a composite barrier cap consists of (from top to bottom): a topsoil layer, a protective soil layer, an aggregate or sand drainage layer with a minimum permeability of 1 x 10(-2) cm/s, a flexible membrane liner, a GCL soil barrier layer with a maximum permeability of 1 x 10(-8) cm/s, and a bedding layer. In addition to the cap, access restrictions will be implemented to restrict site use and access. These restrictions will include deed restrictions to control site development and groundwater use and fencing to inhibit unauthorized access to the landfill property.

Present Worth Cost:	$4,700,000
Time to Implement:	4 months

Summary of the Comparative Analysis of Alternatives

The nine criteria used by U.S. EPA to evaluate remedial alternatives, as set forth in the NCP, 40 CFR Part 300.430, include: overall protection of human health and the environment; compliance with applicable or relevant and appropriate requirements (ARARs); long-term effectiveness; reduction of toxicity, mobility, or volume; short-term effectiveness; implementability; cost; state acceptance; and community acceptance.

THRESHOLD CRITERIA

Table A-1
DRL Site Landfill Operable Unit
Federal and State ARARs
(Page 1 of 2)

Remedial Activity and Applicable Alternatives	Federal ARAR	State ARAR	Comment
Waste classification for landfill contents (all alternatives)	40 CFR, Part 261: Identification and Listing of Hazardous Waste, Subparts A (General), B (Criteria), C (Characteristics), and Appendices.	329 IAC Article 3.1, Rules 1, 4-6.	Establishes that RCRA hazardous wastes were disposed in landfill, and soils mixed with waste are hazardous.
Hazardous Waste Landfill Closure and Post-Closure Care (all alternatives)	40 CFR Part 264, Subpart N (264.310 Closure and Post-Closure Care, and 264.301 Design and Operating Requirements and 264.117 Post-Closure Use).	329 IAC Article 3.1, Rule 9	Performance standards for new RCRA landfills require covers that minimize infiltration and has a permeability no greater than 1×10^{-7} cm/s. Post-closure use of property restricted as necessary to prevent damage to cover.
Solid Waste Landfill Closure and Post-Closure Care (all alternatives)	40 CFR Part 258.60	329 IAC Article 2-14-19	Federal performance standards for new landfills require 18 inches of 1×10^{-5} cm/s or less layer, with 6 inches of topsoil. State regulations specify 2 feet of compacted clay with 6 inches of topsoil. May be deemed relevant and appropriate.
Stormwater Control Requirements (Alternatives 2-4)		327 IAC Article 15, Rule 5: Storm Water Run-off Associated with Construction	Applicable.

Table 2

2).

BALANCING CRITERIA

Long Term Effectiveness

Addresses any expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup standards have been met.

All of the alternatives involve leaving wastes in place and the long term effectiveness and permanence is entirely dependent on the durability and maintenance of the covers and caps and the ability to limit infiltration of rainwater.

Alternatives 2, 3A, 3B, 4A, and 4B provide both access restrictions and containment technologies, including caps and surface controls. The capping systems incorporated by Alternatives 2, 3A, 3B, 4A and 4B provide similar levels of protection from direct contact with the landfill contents.

Alternatives 2, 3A, 3B, 4A, and 4B will prevent direct contact with the landfill contents, will control surface water runoff and erosion, and will prevent volatilization and fugitive dust emissions from surficial soil contamination.

Alternative 2 will prevent contact with the landfill contents but will not limit the infiltration of rainwater. Alternatives 3A, 3B, 4A, and 4B will prevent contact with the landfill contents and will also limit the infiltration of rainwater to prevent contamination of groundwater from the landfill contents. This limitation on infiltration will decrease the transport of contaminants to the groundwater, which will assist in long term groundwater remediation by limiting the amount of contaminants migrating into the groundwater.

Alternatives 3A, 3B, 4A, and 4B are functionally equivalent with respect to this balancing criterion and are superior to Alternative 2 because of long term reliability and reduction of rainwater infiltration. However, Alternatives 4B provides higher levels of infiltration protection than Alternatives 3A, 3B, and 4A, resulting in greater long-term effectiveness and permanence.

Reduction of Toxicity, Mobility or Volume (TMV) through Treatment

Addresses the anticipated performance of the treatment technologies a remedy may employ.

All of the alternatives will reduce the mobility of groundwater contamination at the site by reducing the amount of rainwater that can infiltrate into the landfill and leach contaminants from the landfill contents. None of the alternatives provides reduction of

and 4B. This becomes more important because the timeframe for installation of the cap necessitates construction in times when weather may hinder performance.

Therefore, it has been determined that Alternatives 3B and 4B are functionally equivalent and superior to Alternatives 2, 3A, and 4A, primarily because of the lack of a locally available clay source and the greater tolerance to adverse weather conditions.

Implementability

Addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed for a particular option to be put in place.

The implementability of the alternatives is based on availability of materials to construct the caps and the ease in obtaining administrative permits to perform the work. Implementing Alternatives 2, 3A, 3B, 4A, and 4B entails managing construction activities, locating and ordering materials for construction, and obtaining permits related to the remedial action.

Materials for Alternatives 2, 3B, and 4B are readily available while the clay layer component of Alternatives 3A and 4A lacks a locally available source.

Weather related concerns also impact implementability of the alternatives. Alternatives 3A and 4A depend on the placement of a compacted clay layer, which cannot be constructed in inclement weather. Alternatives 3B and 4B cover construction is not as weather dependent as the other alternatives as the placement of the membrane and geosynthetic layer can be accomplished under adverse weather conditions.

Therefore, Alternatives 3B and 4B have been determined to be functionally equivalent with respect to this balancing criterion, and are superior to Alternatives 2, 3A and 4A.

Cost

Included are capital costs, annual operation and maintenance costs (assuming a 30 year time period), and net present value of capital and operation and maintenance costs. The selected remedy must be cost effective.

The FS presented net present worth cost estimates for each of the seven alternatives brought forward for detailed analysis. These estimates were derived from literature, vendor quotations, actual costs from similar projects, and standard cost information sources. Cost estimates are provided primarily for the purpose of conducting a comparative assessment between remedial options, in order to assess the economic feasibility of the different alternatives.

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COMPENDIUM OF CERCLA RESPONSE SELECTION GUIDANCE DOCUMENTS

Doc No	Vol	Title	Date	Authors	Status	Pages	Tier	Attachments	OSWER/EPA Number
**		Enforcement							
8000	32	ENDANGERMENT ASSESSMENT GUIDANCE	11/22/85	- PORTER, J W /OSWER	Final	11	2		OSWER #9850 0-1
8001	32	INTERIM GUIDANCE ON POTENTIALLY RESPONSIBLE PARTY PARTICIPATION IN REMEDIAL INVESTIGATIONS AND FEASIBILITY STUDIES	05/16/88	- PORTER, J W /OSWER	Final	37	2		OSWER #9835 1a
**		Selection of Remedy/Decision Documents							
9000	32	INTERIM GUIDANCE ON SUPERFUND SELECTION OF REMEDY	12/24/86	- PORTER, J W /OSWER	Final	10	2		OSWER #9355 0-19
9001	32	RCRA/CERCLA DECISIONS MADE ON REMEDY SELECTION	06/24/85	- KILPATRICK, M /COMPLIANCE BRANCH, OWPE	Final	3	2		

mobility of contaminants through capping. Alternatives 2, 3A and 4A are not as effective in the long term at reducing the mobility of contaminants through capping.

Alternatives 3B and 4B are more effective in the short term than Alternatives 3A and 4A due to the lack of locally available clay deposits to use in the construction of the cap and the time and effort necessary to place and compact these materials during cap installation. Alternatives 3B and 4B are easier to implement than Alternatives 3A and 4A because of the more readily available GCL liner materials compared with the lack of locally available clay. Alternative 4B provides greater long term protection of landfill contents from precipitation infiltration than Alternative 3B, which will benefit long term remediation of contaminated groundwater coming from the site, which will help to ultimately reduce the risks posed by the landfill contents.

Therefore, the best balance among the seven alternatives, while providing for protection of human health and the environment and long term effectiveness and permanence, is Alternative 4B, Composite Barrier Cap with a GCL Soil Barrier Layer.

Selected Remedy

U.S. EPA has selected Alternative 4B - Composite Barrier Cap with a GCL Soil Barrier Layer, as the appropriate soil cleanup remedy for the Douglas Road site. This alternative was selected because it is the most appropriate alternative for this operable unit action and is compatible with the final remedial alternative selected for groundwater remediation, because of the reduction in rainwater infiltration provided by the selected response action.

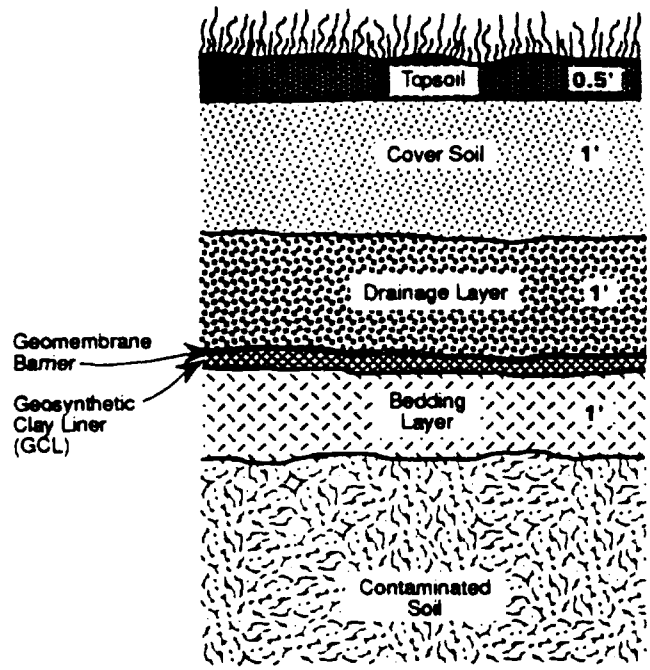
The objective of this operable unit action is to remediate on-site source areas that are contributing to contamination of both soils and groundwater. The FFS contains a description of this alternative. The components of this alternative include site preparation, institutional controls, groundwater monitoring, and placement of cap materials.

Site preparation will consist of clearing and grubbing activities, with the trees and shrubs shredded and placed evenly over the site prior to placement of the gas collection layer.

Access restrictions will be implemented to control site use and access. Access restrictions for this alternative include deed restrictions, which will be sought to limit the use of the site for construction or other site development, and will prohibit the use of groundwater beneath the site for any purpose, and fencing to inhibit unauthorized access to the landfill property, and to protect the remedy components. Warning signs stating the hazards within the landfill area will also be placed along the property boundary as necessary.

Figure 2

SELECTED REMEDY



ALTERNATIVE 4B:
COMPOSITE BARRIER CAP
(WITH GEOCOMPOSITE CLAY LINER GCL)

FIGURE 2 (Sheet 2 of 2)
TYPICAL MULTILAYER LANDFILL CAP SECTIONS
DOUGLAS ROAD LANDFILL FS REPORT

1. Be protective of human health and the environment.

2. Comply with all ARARs established under federal and state environmental laws (or justify a waiver).

3. Be cost effective.

4. Utilize permanent solutions and alternative technologies or recovery technologies to the maximum extent practicable.

5. Satisfy the statutory preference for remedies that utilize treatment and also significantly reduce the toxicity, mobility and volume of the hazardous substances, pollutants, or contaminants.

In addition, CERCLA § 121(c) requires five year reviews to determine if adequate protection of human health and the environment is being maintained where remedial actions result in hazardous substances remaining on-site above health-based levels. The selected remedy for the Douglas Road Landfill Site achieves these requirements as discussed in detail below.

Protection of Human Health and the Environment

The selected remedy for the source control operable unit achieves the requirement of being protective of human health and the environment by containing the source contamination and isolating it from the environment. Baseline cancer risks from the site exceed the 10-4 to 10-6 acceptable risk range established by EPA in the NCP. Deed restrictions will ensure that future land use of the source area will not impose an unacceptable risk. Non-carcinogenic risks will be reduced to levels less than the EPA standard of 1.0, through institutional and source control measures.

Compliance with ARARs

The selected alternative complies with all chemical, action and location specific applicable or relevant and appropriate requirements (ARARs) for the Site. A detailed discussion of the ARARs and to be considered (TBCs) is presented above and a complete list of ARARS and TBCs is in the Focused Feasibility Study.

Chemical-Specific ARARs

Chemical-Specific ARARs do not exist for contaminated source soils at the Site. TBCs, such as reference concentrations and potency factors were evaluated as part of the risk analysis for the Site. The selected alternative will meet the TBC based clean-up goals for the source area.

Action-Specific ARARs

APPENDIX A

Douglas Road Landfill
Michigan City, Indiana

Responsiveness Summary

I. Responsiveness Summary Overview

In accordance with CERCLA Section 117, a public comment period was held from March 23, 1995 to April 24, 1995, to allow interested parties to comment on the United Stated Environmental Protection Agency's (U.S. EPA's) Focused Feasibility Study (FFS) and Proposed Plan for the Douglas Road Landfill Superfund site (the Site). At a April 5, 1995 public meeting, EPA and Indiana Department of Environmental Management (IDEM) officials presented the Proposed Plan for remediation for the landfill capping phase at the Site, answered questions and accepted comments from the public. Written comments were also received through the mail.

II. Background of Community Concern

The Douglas Road Landfill operated from 1954 to 1979 as a repository for Uniroyal plant wastes. From 1954 to 1971, solvents, fly ash, paper, wood stock, rubber and plastic scrap were disposed of at the landfill. Only fly ash was disposed of from 1971 to 1979.

The Site was nominated for inclusion on the NPL on June 10, 1986 and placed on the NPL on March 31, 1989. In September, 1989, the State of Indiana and Uniroyal signed a consent decree in which Uniroyal agreed to perform a RI/FS at the site. Before completion of this work, Uniroyal filed for bankruptcy and discontinued work at the site (November 1991). Following the bankruptcy, it was determined that U.S. EPA should regain the site lead and the RI/FS was began in early 1994, using Superfund money.

During the RI, it was discovered that residential wells in the vicinity of Douglas Road and State Road 23 were contaminated with vinyl chloride and trichloroethylene (TCE), contaminants that had been identified as coming from the site. These residents received the following temporary measures to provide protection until a permanent remedy could be implemented for the affected wells: for those with vinyl chloride contamination, residents received portable air strippers and for those with TCE contamination, residents received in-line filters.

EPA response 3: EPA agrees with the commentors and is taking the steps necessary to provide city water as soon as possible. Right now, funding for the water line project is temporarily unavailable. EPA had planned to use funding which would have been provided from it's Headquarters office located in Washington, D.C. to design and construct the water line extension. This money has been frozen by EPA Headquarters in anticipation of Congressional budget cuts. Congress is in the process of re-examining EPA's overall budget for potential budget cuts Agency wide. It is hoped that following this process, the project will be funded. Once monies become available, the water line extension will be designed and constructed in a several months, hopefully later this year.

4. A commentor raised a number of concerns regarding the groundwater phase and it's interrelation with the proposed capping portion of the Site cleanup.

EPA response 4: EPA appreciates the input and suggestions for characterizing and cleaning up area groundwater. EPA will factor these concerns into any future plans for groundwater cleanup. As was stated in the meeting, the proposed capping of the landfill is closely interrelated with future cleanup plans for area groundwater.

EPA proposed this capping alternative because it's implementation will greatly augment future groundwater cleanup.
EPA will propose a final remedy for area groundwater cleanup this summer, for which the commentor and the rest of the public will have the opportunity to provide input to the EPA.

The comments are paraphrased in order to effectively summarize them in this document. The reader is referred to the public meeting transcript which is available in the public information repository, which is located at the Mishawaka-Penn Public Library. Written comments received at EPA's regional office are on file in the Region 5 office. A copy of these written comments has also been placed in the aforementioned repositories.

DOC#	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
14	07/22/93	Schafer, G., U.S. EPA	Plomb, D., CH2M Hill	Cover Letter Forwarding Three Boxes of Raw Analytical Data	1
15	07/27/93	Helmer, E., U.S. EPA	Schafer, G., U.S. EPA	Memorandum re: Ecological Review of the Draft RI/FS Work Plan	2
16	08/11/93	Nathan, S., U.S. EPA	Sandoval, M., U.S. EPA	Memorandum Forwarding Attached August 11, 1993 Statement of Work (Revision 1)	37
17	08/11/93	Schafer, G. and Nathan, S., U.S. EPA	File	Memorandum re: Summary of Discussions Held at the June 28, 1993 Kickoff Meeting with CH2M Hill	4
18	08/11/93	Gorski, W., U.S. EPA	Figliulo, I., U.S. EPA	Memorandum re: Wetlands Regulatory Unit's Review of the Draft RI/FS Work Plan	1
19	08/18/93	Schafer, G., U.S. EPA	Plomb, D., CH2M Hill	Cover Memorandum Forwarding Various Documents re: the Quality Assurance Project Plan	1
20	08/19/93	Watters, E., U.S. EPA	Traub, J., U.S. EPA	Memorandum re: Water Division's Review of the RI/FS Work Plan	3
21	08/23/93	Kasarabada, P., IDEM	Schafer, G., U.S. EPA	Letter re: IDEM's Review Comments on the RI/FS Work Plan	4
22	08/24/93	Schafer, G., U.S. EPA	Plomb, D., CH2M Hill	Letter re: U.S. EPA/IDEM's Review Comments on the Draft RI/FS Work Plan	5
23	09/14/93	Plomb, D. and Ohland, C., CH2M Hill	Schafer, G., U.S. EPA	Memorandum re: DRL Meeting Minutes (FASP and Geoprobe)	3
24	09/17/93	Schafer, G., U.S. EPA	Addressees	Memorandum re: Summary of September 2, 1993 Minutes from the FASP/Geoprobe Meeting	4
25	11/01/93	CH2M Hill	U.S. EPA	Report: Work Plan for the RI/FS	95
26	11/05/93	Plomb, D., CH2M Hill	Schafer, G., U.S. EPA	Cover Letter Forwarding the Quality Assurance Project Plan, Field Sampling Plan, and Health and Safety Plan	1
27	11/05/93	CH2M Hill	U.S. EPA	Health and Safety Plan	26
28	12/09/93	Schafer, G., U.S. EPA	Plomb, D., CH2M Hill	Letter Forwarding Attached CH2M Hill's Comments on the Draft Quality Assurance Project Plan w/Attachments	35

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45	09/19/94	Krieg, D., Ecology & Environment, Inc.	Theisen, K., U.S. EPA	FAX Transmittal Forwarding Chain of Custody Records and Field Sample Data Sheets for Residential Well Sampling w/Attachments	22
46	09/23/94	CH2M Hill	U.S.EPA	Technical Memorandum #1: Summary of Field Investigation Data Collection Activities	58
47	10/11/94	Theisen, K., U.S. EPA	South Bend Residents	Letters to Eleven Residents re: Results of September 13, 1994 Residential Well Sampling for VOCs	11
48	12/01/94	Novak, D., U.S. EPA	Ostrodka, S., U.S. EPA	Cover Memorandum Forwarding the Risk Assessment	1
49	12/15/94	Plomb, D., CH2M Hill	Novak, D., U.S. EPA	Cover Letter Forwarding the Agency Review Draft of the RI Report	1
50	01/03/95	Podowski, A., U.S. EPA	Novak, D., U.S. EPA	Memorandum re: Technical Support Section's Review Comments on the Baseline Risk Assessment w/Attachments	9
51	01/05/95	Micheal, E., St. Joseph County Health Department	Novak, D., U.S. EPA	Letter re: SJCHD's Request to U.S. EPA to Conduct Water Sampling to Verify the Effectiveness of the Water Filtration Devices w/Attached Documents from the SJCHD's Douglas Road Site File	17
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54	01/11/95	Chapman, J., U.S. EPA	Novak, D., U.S. EPA	Memorandum re: Technical Support Section's Review Comments on the Agency Review Draft RI Report	2
55	01/20/95	Theisen, K., U.S. EPA	South Bend Residents	Letters to Two Residents re: Results of November 14, 1995 Residential Well Sampling for VOCs	2

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76	03/15/95	U.S. EPA	Public	Public Notice re: Announcement of April 5, 1995 Public Meeting and March 23-April 24, 1995 Public Comment Period	1
77	03/20/95	Novak, D., U.S. EPA	Plomb, D., CH2M Hill	Letter re: U.S. EPA's Review of the Revised FFS Report	1
78	03/21/95	Grejda, H., IDEM	Novak, D., U.S. EPA	Letter re: IDEM's Review Comments on the Second Draft of the RI Report	5
79	04/04/95	Grejda, H., IDEM	Novak, D., U.S. EPA	Letter re: IDEM's Review Comments on the First Draft of the Work Plan for Remedial Design	2
80	04/07/95	Beutter, R., City of Mishawaka	U.S. EPA/OPA	Letter re: Mayor's Comments Concerning the Proposed Plan	2
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0000	1	INDEX TO COMPENDIUM OF CERCLA RESPONSE SELECTION GUIDANCE DOCUMENTS	05/01/89	- OWPE - PRC ENVIRONMENTAL MANAGEMENT, INC	Final	8		1) DATA ELEMENT DEFINITIONS 2) ORGANIZATIONAL ABBREVIATIONS AND ACRONYMS IDENTIFIED IN INDEX	
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1004	1	GUIDANCE ON IMPLEMENTATION OF THE "CONTRIBUTE TO REMEDIAL PERFORMANCE" PROVISION	04/08/87	- OSWER	Final	6	2		OSWER #9360.0-11
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2102	6	DATA QUALITY OBJECTIVES FOR REMEDIAL RESPONSE ACTIVITIES EXAMPLE SCENARIO RI/FS ACTIVITIES AT A SITE W/ CONTAMINATED SOILS AND GROUNDWATER	03/01/87	- CDM FEDERAL PROGRAMS CORP - CERR/CMPE	Final	120	1		OSWER #9355.0-7B
2103	6	DESIGN AND DEVELOPMENT OF HAZARDOUS WASTE REACTIVITY TESTING PROTOCOL	02/01/84	- MOLBACH, C.D., ET AL /ACUREX CORP - BARKLEY, N /MERL	Final	150	1		EPA 600/2-84-057
2104	6	FIELD SCREENING FOR ORGANIC CONTAMINANTS IN SAMPLES FROM HAZARDOUS WASTE SITES	04/02/86	- ROFFMAN, H.K., ET AL /NUS CORP - CARTER, A /MICHIGAN DEPT OF NATURAL RESOURCES - THOMAS, T /EPA	Final	11	2	1) MEMO FIELD SCREENING FOR ORGANIC CONTAMINANTS	
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2113	8	LABORATORY DATA VALIDATION FUNCTIONAL GUIDELINES FOR EVALUATING INORGANICS ANALYSES	07/01/88	- EPA DATA REVIEW WORK GROUP - BLEYLER, R /VIAR AND CO /SAMPLE MGMT OFFICE - HSED	Draft	20	2		
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2206	15	LINING OF WASTE IMPOUNDMENT AND DISPOSAL FACILITIES	03/01/83	- LANDRETH, R /MERL	Final	480	2		OSWER #9480.00-4
2207	15	PROCEDURES FOR MODELING FLOW THROUGH CLAY LINERS TO DETERMINE REQUIRED LINER THICKNESS	01/01/84	- OSW	Draft	145	2		OSWER #9480.00-9D
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2210	15	SUPPLEMENTARY GUIDANCE ON DETERMINING LINER/LEACHATE COLLECTION SYSTEM COMPATIBILITY	08/07/86	- WEDDLE, B R /PERMITS AND STATE PROGRAMS DIV	Final	60	2	1) ANALYSIS AND FINGERPRINTING OF UNEXPOSED & EXPOSED POLYMERIC MEMBRANE LINERS MAIRECON, INC 2) SEC 3019 EXPOSURE INFO AND HEALTH ASSESSMENTS	OSWER #9480.00-13
2211	15	TECHNICAL GUIDANCE DOCUMENT CONSTRUCTION QUALITY ASSURANCE FOR HAZARDOUS WASTE LAND DISPOSAL FACILITIES	10/01/86	- HERRMANN, J G /MERL/LAND POLLUTION CONTROL DIV - OSWER	Final	88	2		OSWER #9472.001
2212	15	TREATMENT OF REACTIVE WASTES AT HAZARDOUS WASTE LANDFILLS PROJECT SUMMARY	01/01/84	- SCHEDER, D, ET AL /ARTHUR D LITTLE, INC - LANDRETH, R /MERL	Final	4	2		EPA/600/S2-83/118
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2315	21	REVIEW OF IN-PLACE TREATMENT TECHNIQUES FOR CONTAMINATED SURFACE SOILS-VOL 2 BACKGROUND INFORMATION FOR IN-SITU TREATMENT	11/01/84	- SIMS, R C , ET AL /JRB ASSOCIATES - BARKLEY, N /MERL	Final	350	1		EPA-540/2-84-003D
2316	21	REVIEW OF IN-PLACE TREATMENT TECHNIQUES FOR CONTAMINATED SURFACE SOILS-VOL 1 TECHNICAL EVALUATION	09/19/84	- OSWER/OERR - ORD/MERL	Final	165	1		EPA/540/2-84-003A
2317	22	SLURRY TRENCH CONSTRUCTION FOR POLLUTION MIGRATION CONTROL	02/01/84	- OERR - ORD/MERL	Final	220	1		EPA/540/2-84-001
2318	22	SYSTEMS TO ACCELERATE IN SITU STABILIZATION OF WASTE DEPOSITS	09/01/86	- AMOUREK, M , ET AL /ENVIROSPHERE CO - CRUBE, W /MERL	Final	285	1		EPA 540/2-86/002
2319	22	TECHNOLOGY SCREENING GUIDE FOR TREATMENT OF CERCLA SOILS AND SLUDGES	09/01/88	- OSWER/OERR	Final	130	1		EPA 540/2-88/004
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4001	26	GUIDANCE DOCUMENT FOR PROVIDING ALTERNATE WATER SUPPLIES	02/01/88	- OERR	Final	64	2		OSWER #9355.3-03
4002	26	INTERIM FINAL GUIDANCE ON REMOVAL ACTION LEVELS AT CONTAMINATED DRINKING WATER SITES	10/06/87	- OSWER/OERR	Final	9	2		OSWER #9360.1-01
4003	26	QUALITY CRITERIA FOR WATER 1986	05/01/87	- OFFICE OF WATER REGULATIONS AND STANDARDS	Final	335	2		EPA/440/5-86-001
7301	16	CARBON ADSORPTION ISOTHERMS FOR TOXIC ORGANICS [Secondary Reference]	04/01/80	- DOBBS, R A /MERL - COHEN, J M /MERL	Final	321	2		EPA/600/8-80-023
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5001	27	CHEMICAL, PHYSICAL & BIOLOGICAL PROPERTIES OF COMPOUNDS PRESENT AT HAZARDOUS WASTE SITES	09/27/85	- CLEMENT ASSOCIATES, INC.	Final	320	2		OSWER #9850.3
5002	27	FINAL GUIDANCE FOR THE COORDINATION OF ATSDR HEALTH ASSESSMENT ACTIVITIES WITH THE SUPERFUND REMEDIAL PROCESS	05/14/87	- PORTER, J W /OSWER/OERR - ATSDR	Final	22	2	1) SAME TITLE, DATED 4/22/87	OSWER #9285.4-02
5003	27	GUIDELINES FOR CARCINOGEN RISK ASSESSMENT (FEDERAL REGISTER, SEPTEMBER 24, 1986, p. 33992)	09/24/86	- EPA	Final	13	2		

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5012	31	ROLE OF ACUTE TOXICITY BIOASSAYS IN THE REMEDIAL ACTION PROCESS AT HAZARDOUS WASTE SITES	08/01/87	- ATHEY, L A , ET AL /PACIFIC NORTHWEST LABORATORY - MILLER, W E /CORVALLIS ENVIRONMENTAL RESEARCH LAB	Final	106	2		EPA/600/8-87/044
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8000	32	ENDANGERMENT ASSESSMENT GUIDANCE [Secondary Reference]	11/22/85	- PORTER, J W /OSWER	Final	11	2		OSWER #9850 0-1
**		Cost Analysis							
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6001	32	REMOVAL COST MANAGEMENT MANUAL	04/01/88	- OSWER/OERR	Final	170	1		OSWER #9360 0-02H
1003	1	ENVIRONMENTAL REVIEW REQUIREMENTS FOR REMOVAL ACTIONS [Secondary Reference]	04/13/87	- OERR/ERD	Final	6	2		OSWER #9318 0 05
**		Community Relations							
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Declaration for the Record of Decision
Douglas Road Landfill
Landfill Cap Operable Unit

Site Name and Location

Douglas Road Landfill
Mishawaka, Indiana

Statement of Basis and Purpose

This decision document presents the selected remedial action for the landfill cap operable unit at the Douglas Road Landfill Site (the Site) in Mishawaka, Indiana. This remedial action was selected in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Contingency Plan. The selection of this remedy is based on the Administrative Record for the Site.

The State of Indiana concurs with the selected remedy.

Assessment of the Site

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to human health, welfare, or the environment.

Description of the Selected Remedy

This operable unit action is the first of two planned for this Site. It specifically outlines an action to address on-site soil and waste material contamination, which have been determined by the Remedial Investigation to pose unacceptable risks to human health and the environment.

The major components of the selected remedy include:

- Installation of a Composite Barrier Cap with a GCL Soil Barrier Layer, meeting the requirements of 329 IAC 2-14-19.
- Collection and disposal of landfill gas
- Perimeter ditches to collect surface water drainage
- Groundwater and source area monitoring to ensure that the goals of this action are met.